31st Annual Fall Meeting

"Exploiting the DNA damage response to prevent and cure cancer"

Wednesday, November 14, 2013

Sheraton Imperial Hotel and Convention Center
4700 Emperor Blvd.
Durham NC 27703

The Genetics and Environmental Mutagenesis Society

- The Society consists predominantly of scientists, students and other interested individuals from private, corporate, government and university organizations, with membership open to all interested parties.

- The goal of GEMS is to promote the study of genetic factors and environmental agents that may pose a genetic risk to humans, and to provide a forum for discussion and interactions among scientists.

- GEMS presents two scientific meetings each year for the membership and guests.

- GEMS provides an opportunity for students and young scientists to become engaged in current scientific topics. Our meetings give young investigators a forum to network with other scientists and to showcase new research. Award winners typically use their grants for attending professional meetings that otherwise they may have been unable to afford.

- Student and post-doctoral trainee GEMS members from government, colleges and businesses in North Carolina are provided an opportunity to hone their presentation skills, meet with senior investigators and peers, and learn more about new trends in biomedical research while competing for juried awards.

  http://www.gems-nc.org/contacts.html

President-Elect's Message

Dear GEMS Members, Postdocs, Students and Guests,

With great pleasure, I welcome you to an exciting 31st Annual Fall Meeting of the Genetics and Environmental Mutagenesis Society. The theme of this meeting is **"Exploiting the DNA damage response to prevent and cure cancer"**.

The field of DNA damage responses has expanded considerably over the past 40 years motivated first by the demonstration that many carcinogens were mutagens that damage DNA, second by the identification of familial cancer syndromes with defects in DNA repair and third by the realization that many tumor suppressor genes are components of the DNA damage response. The Loeb mutator theory of carcinogenesis holds that the normal rate of mutation is too low to generate the 6-8 independent mutations needed to produce cancer. As cancer is a common disease, an early event in carcinogenesis must increase the rate of mutation. It is very likely that germline and somatic mutations in *TP53, HMLH1* and *ATM* are mutators that increase the rate of mutation.

Pathways of DNA repair and DNA damage checkpoints protect against development of cancer by reducing the levels of DNA damage or enhancing the time available for repair of the damage. These DNA damage responses not only protect against the development of cancer they protect cancer cells from radiation and chemotherapies that seek to cure the disease. The demonstration of synthetic lethalities where a weakly toxic insult can be transformed into a highly toxic lesion by modification of gene expression has renewed interest in the DNA damage response. Inhibitors of poly(ADP-ribose) polymerase have modest toxicity normally but in cells with inactivation of BRCA1-dependent homologous recombination these drugs have massive toxicity. We seek now development of new combinations of drugs to kill cancer cells with greater specificity and thereby enhance cure rates.

A remarkable discovery was the demonstration that the XPA nucleotide excision repair factor varied in its expression according to the time of day. Circadian regulation of NER in skin implies that our risk of skin cancer may vary with the time of harmful UV exposure. Circadian regulation of NER may also influence the efficacy of chemotherapies and this implies that the timing of treatment (and standard of care) may need to be modified.

These aspects of DNA damage response focus our interest and motivate the assembly of our program of speakers today.

I look forward to seeing you all at the meeting.

William Kaufmann
GEMS President-elect

AGENDA:

GEMS
Genetics and Environmental Mutagenesis Society

Exploiting the DNA damage response to prevent and cure cancer

8:00-8:45 am Arrival and registration with continental breakfast

8:45 am Welcome William Kaufmann

9:00 - 9:45 am "DNA damage responses: bedside to bench to bedside" Michael Kastan

9:45 - 10:30 am "Potentiating Top1 Poisons by Modulating the DNA Damage Response – New Strategies for AML Treatment" William Gmeiner

10:30- 11:00 am Coffee break

11:00- 11:15 am "Biochemical Analysis of DNA Polymerase h Fidelity in the Presence of Replication Protein A". Samuel C. Suarez, NCSU

11:15-11:30 am "Arsenite and methyl methanesulfonate (MMS) co-exposures induce synergistic cellular responses associated with carcinogenic pathways" Pergentino Balbuena, The Hamner Institutes of Health Sciences

11:30-11:45 am "Functional genomics approach in yeast identifies DNA repair genes important in response to trichloroethylene" Vanessa DeLaRosa, UNC-CH/UC-Berkeley

11:45-12:00 pm "C/EBPα regulates $p21^{CIP1/WAF1}$ protein levels during the UVB-induced DNA damage checkpoint response" Jonathan R. Hall, NCSU

12:00-1:15 pm Lunch

1:15-2:45 pm Poster viewing with corporate sponsors

2:45-3:30 pm "Control of DNA Repair and Cancer by the Circadian Clock" Aziz Sancar

3:30 pm GEMS business meeting and awards presentations Tom Hughes

4:00 pm Adjourn